



City of Portland Stormwater Management Manual

September 1, 2004

Appendices:

Appendix A: City Code Chapter 17.38, Policy Framework, Appeals & Update Process

Appendix B: Vendor Submission Guidance for Stormwater Treatment Technologies

Appendix C: Santa Barbara Urban Hydrograph Method

Appendix D: Simplified Approach Sizing Calculations

Appendix E: Pollution Reduction Storm Report

Appendix F: Facility Planting & Soil Recommendations

Appendix G: Supplemental Drawings

Appendix H: Stormwater Facility Photos

Reference & Resources

Index

Appendix A

CITY CODE CHAPTER 17.38,

POLICY FRAMEWORK, APPEALS AND UPDATE PROCESS

A.1 CITY CODE CHAPTER 17.38

17.38.015

B. Adoption of Rules.

1. During the public review, a designee of the Director shall hear testimony and receive written comments concerning the proposed rules. The Director shall review the recommendation of his or her designee, taking into consideration the comments received during the public review process and shall either adopt the proposal, modify or reject it.
2. If a substantial modification is made to the rules submitted for public review, the Director may adopt the modification as Interim Rules or shall provide an additional public review prior to adoption.
3. Unless otherwise stated, all rules shall be effective upon adoption by the Director and shall be filed in the Office of the Director.

C. Interim Rules.

1. Notwithstanding paragraphs 17.38.015 A. and B., an interim rule may be adopted without prior notice upon a finding that failure to act promptly will result in serious prejudice to the public interest or the interest of the affected parties. The rule should include the specific reasons for such prejudice.
2. Any rule adopted pursuant to this paragraph shall be effective for a period of not longer than 180 days.
3. After adoption, public notice of interim rules shall be given by publication in a newspaper of general circulation and notice sent to the Office of Neighborhood Involvement. Such notice shall include the location at which copies of the full set of the interim rules may be obtained.

- D. Initial Rules. Notwithstanding sections 17.38.015 A-C. above, the rules contained in the Stormwater Management Manual filed with the Council in conjunction with Ordinance No. 173330 may be adopted by the Director without further public review.

17.38.020 Purpose.

The purpose of this Chapter is to provide for the effective management of stormwater and drainage, and to maintain and improve water quality in the Watercourses and Water Bodies within the City of Portland as described in 17.38.025.

17.38.025 Stormwater Management Policies and Standards.

- A. Stormwater shall be managed as close as is practicable to development sites, and stormwater management shall avoid a net negative impact on nearby streams, wetlands, groundwater, and other waterbodies. All local, state and federal permit requirements related to implementation of stormwater management facilities must be met by the owner/operator prior to facility use. Surface water discharges from on-site facilities shall be conveyed via an approved drainage facility.
- B. The quality of stormwater leaving the site after development shall be equal to or better than the quality of stormwater leaving the site before development, as much as is practicable, based on the following criteria:
1. Water quality control facilities required for development shall be designed, installed and maintained in accordance with the Stormwater Management Manual, which is based on achieving at least 70% removal of the Total Suspended Solids (TSS) from the flow entering the facility for the design storm specified in the Stormwater Management Manual or Administrative Rules.
 2. Land use activities of particular concern as pollution sources shall be required to implement additional pollution controls, including, but not limited to, those management practices specified in the Stormwater Management Manual.
 3. Development in a watershed that drains to streams with established Total Maximum Daily Load limitations, as provided under the Federal Clean Water Act, Oregon Law, Administrative Rules and other legal mechanisms shall assure that water quality control facilities meet the requirements for pollutants of concern, as stated in the Stormwater Management Manual.

4. Stormwater discharge, which is not practicable to fully treat as defined in sections 17.38.025 B.1-3. and the Stormwater Management Manual, shall either: be treated in an off-site facility or be given the option of paying a stormwater off-site management fee. The Bureau will employ a methodology for calculating the fee that is based upon an average unit cost of on-site facilities where such facilities would be effective. The stormwater off-site management fee collected will be placed in a mitigation account to be used to mitigate the impacts that arise from off-site discharge of stormwater runoff. Information relating to sites that are paying fees will be evaluated in planning for capital improvement projects.
 5. Notwithstanding section 17.38.025 B.4., for any parcel created after the effective date of this Chapter, stormwater shall be fully treated on-site or within the original parcel from which the new parcel was created, or in a privately developed off-site facility with sufficient capacity, as determined by the Bureau.
- C. The quantity of stormwater leaving the site after development shall be equal to or less than the quantity of stormwater leaving the site before development, as much as is practicable, based on the following criteria:
1. Development shall mitigate all project impervious surfaces through retention and onsite infiltration to the maximum extent practicable. Where onsite retention is not possible, development shall detain stormwater through a combination of provisions that prevent an increased rate of flow leaving a site during a range of storm frequencies as specified in the Stormwater Management Manual.
 2. The Director may exempt areas of the city from the requirement of 17.38.025 C.1. if flow control is not needed or desirable and if:
 - a. Stormwater is discharged to a large waterbody directly through a private outfall, or
 - b. Stormwater is discharged to a waterbody directly through a separated public storm sewer having adequate capacity to convey the additional flow.
 3. Any development that contributes discharge to a tributary to the Willamette River, other than the Columbia Slough, shall design facilities such that the rate of flow discharging from water quantity control facilities for up to a two-year storm does not lengthen the period of time the channel sustains erosion-causing flows, as determined by the Bureau. .

4. Facilities shall be designed to safely convey the less frequent, higher flows through or around facilities without damage.
5. Stormwater quantity discharge which is not practicable to be managed as defined in 17.38.025 C.1. through 17.38.025 C.4. and the Stormwater Management Manual shall either: be managed in an off-site facility or be given the option of paying a stormwater off-site management fee. The Bureau will employ a methodology for calculating the fee that is based upon an average unit cost of on-site facilities where such facilities would be effective. The stormwater off-site management fee collected will be placed in a mitigation account to be used to mitigate the impacts that arise from off-site discharge of stormwater runoff. Information relating to sites that are paying fees will be evaluated in planning for capital improvement projects.
6. Notwithstanding section 17.38.025 C.5., for any parcel created after the effective date of this chapter shall fully manage stormwater on-site or within the original parcel from which the new parcel was created, or in a privately developed off-site facility with sufficient capacity, as determined by the Bureau.

17.38.030 Definitions.

- A. **Approved Drainage System.** A system approved by BES which, in general, shall adequately collect, convey, treat and or dispose of stormwater runoff or other site discharge. Approved systems shall meet all requirements and specifications laid out in this code or in any BES design guidance document plus any applicable plumbing code provisions relating to the piped portions of any system.
- B. **“Capacity”.** The capacity of a stormwater system shall mean the flow volume or rate that a facility (e.g., pipe, pond, vault, swale, ditch, drywell, etc.) is designed to safely contain, receive, convey, treat or infiltrate stormwater that meets a specific performance standard. There are different performance standards for treatment, detention, conveyance, and disposal. Example: Public storm sewer pipes are required to convey the 10-year storm without surcharge, and the 25-year storm without damage to property or endangering human life or public health. Public infiltration sumps are required to infiltrate the 10-year storm with a safety factor of two. Combined sewers that overflow during a 25-year storm are not considered to have adequate capacity.

- C. "Combination Facilities". Systems that are designed to meet two or more of the multiple objectives of stormwater management.
- D. "Director". The Director of the Bureau of Environmental Services, or the Director's designee.
- E. "Disposal". The ultimate discharge point for the stormwater from a site. Disposal points can include drywells and sumps, soakage trenches, ditches, drainageways, rivers and streams, off-site storm pipes, and off-site combination sewers.
- F. "Drainageway". An open linear depression, whether constructed or natural, which functions for the collection and drainage of surface water. It may be permanently or temporarily inundated.
- G. "Impervious Surface". Any constructed surface that has a runoff coefficient greater than 0.8 (as defined in the Sewer Design Manual, Chart 10 "Runoff Coefficients"). Note: Decks which do not retain water are considered pervious.
- H. "Off-Site Stormwater Facility". Any stormwater management facility located outside the property boundaries of a specific development, but designed to reduce pollutants from and/ or control stormwater flows from that development.
- I. "On-Site Stormwater Facility". Any stormwater management facility necessary to control stormwater within an individual development project and located within the project property boundaries.
- J. "Pollutants of Concern". Watershed-specific parameters identified by the Oregon Department of Environmental Quality (DEQ) as having a negative impact on the receiving water body.
- K. "Practicable". Available and capable of being done as determined by the Director, after taking into consideration cost, existing technology, and logistics in light of overall project purpose.
- L. "Public Works Project". Public works project means any development conducted or financed by a local, state, or federal governmental body and includes local improvements and public improvements, as defined in Title 17, PUBLIC IMPROVEMENTS.
- M. "Redevelopment". Development that requires demolition or complete removal of existing structures or impervious surfaces at a site and replacement with new development. Maintenance activities such as top-layer grinding and repavement are not considered redevelopment.

Interior remodeling projects are also not considered to be redevelopment. Utility trenches in streets are not considered redevelopment unless more than 50% of the street width is removed and re-paved.

- N. "Site Map". For purposes of this code section, a site map shall show the stormwater management facility location in relation to building structures or other permanent monuments on the site. The site map shall depict location of sources of runoff entering the facility and the discharge point and type of receiving system for runoff leaving the facility.
- O. "Stormwater Management". The overall culmination of techniques used to reduce pollutants from, detain, and/ or retain, and dispose of stormwater to best preserve or mimic the natural hydrologic cycle, to accomplish goals of reducing combined sewer overflows, or to incorporate sustainable building practices by reusing stormwater, on a development site. Public health and safety, aesthetics, maintainability, capacity of the existing infrastructure and sustainability are important characteristics of a site's stormwater management plan.
- P. "Stormwater Management Facility". A single technique used to treat, detain, and/or retain stormwater to best preserve or mimic the natural hydrologic cycle, or to fit within the capacity of existing infrastructure, on a development site.
- Q. "Tract". A tract is a section of land set aside from development during the Land Division phase of development. Tract as used in this code section shall be the definition of tract as described in Title 33 of the City Code.
- R. "Water Body". Rivers, streams, sloughs, drainages including intermittent streams and seeps, and ponds, lakes, aquifers, wetlands, and coastal waters.
- S. "Watercourse". Watercourse means a channel in which a flow of water occurs, either continuously or intermittently, and if the latter with some degree of regularity. Watercourses may be either natural or artificial.
- T. "Water Quality Control/Pollution Reduction Facility". Refers to any structure or drainageway or drainage device that is designed, constructed, and maintained to collect and filter, retain, or detain surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality. These facilities may include, but are not limited to, constructed wetlands, water quality swales, and ponds that are maintained as stormwater quality control facilities.

- U. “Water Quantity Control Facility”. Refers to any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development quantity leaving the development site. These facilities may include, but are not limited to, constructed wetlands, infiltration basins, and wet ponds that are maintained as stormwater quantity or quality control facilities.
- V. “Wetland”. An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, and similar areas except those constructed as water quality or quantity control facilities. Specific wetland designations shall be made by the Corps of Engineers and the Division of State Lands.

17.38.040 Stormwater Quality and Quantity Control Facilities Required.

No plat, site plan, building permit or public works project shall be approved unless the conditions of the plat, permit or plan approval require installation of permanent stormwater quality and quantity control facilities designed according to standards or guidelines established by the Director of the Bureau of Environmental Services and as specified in the City of Portland's Stormwater Management Manual.

- A. Exemptions. The requirements of this Chapter for stormwater management do not apply to:
 - 1. Development for which an application for development approval is accepted by the permitting agency prior to July 1, 1999 shall be subject to the requirements in place at the time of application.
 - 2. Development, whether public or private, that does not result in impervious surface coverage or results in coverage that is de minimus, such as fences, environmental enhancement projects, buried pipelines or cables, and utility lines.
 - 3. Transportation improvements which will not directly increase non-point source pollution or quantity of stormwater runoff once construction has been completed (i.e., pavement overlays).

4. Impervious surface created by a water quality or water quantity control facility. Paved or compacted gravel facility access and maintenance roads that extend beyond the facility itself are not exempted from treatment requirements.
- B. Appeals.** Any permit applicant aggrieved by a decision, interpretation, or determination made pursuant to the administration of the Stormwater Management Manual may appeal such action in accordance with 17.38.040 B.1. and B.2.
1. In order to provide for reasonable interpretation of the provisions of the Stormwater Management Manual, the Director shall establish an internal Administrative Appeals Committee and an External Appeals Board. The Commissioner in charge of the Bureau of Environmental Services shall appoint members of the External Appeals Board.
 2. Applicants shall file appeals in accordance with the appeals process procedures specified in the Stormwater Management Manual.
- C. Maintenance of Water Quality and Quantity Control Facilities.**
1. All new development, redevelopment, plats, site plans, building permits or public works projects, as a condition of approval, shall be required to submit an operation and maintenance plan for the required stormwater quality and quantity control facilities for review and approval by the Bureau of Environmental Services. A water quality or quantity control facility that receives stormwater runoff from a public right-of-way shall be a public facility, unless the right-of-way is not part of the city road maintenance system.
 - a. The information required in the operation and maintenance plan shall satisfy the requirements of the Stormwater Management Manual (SWMM). Applicants are encouraged to use the O & M Plan template provided in the SWMM. The Plan shall include and not be limited to:
 - (1) Design plans of the specific facility and related parts, including design assumptions.
 - (2) A schedule for routine inspection, including post storm related inspections.

- (3) A description of the various facility components, the observable trigger for maintenance, and the method of maintenance, including appropriate method of disposal of materials.
 - (4) The intended method of providing financing to cover future operations and maintenance.
 - (5) The party or parties responsible for the maintenance of the facility including the means of effecting contact, including contact means for emergency situations. The party may be an individual or an organization.
 - b. A maintenance log is required. The log shall provide a record of all site maintenance related activities. The log shall include the time and dates of facility inspections and specific maintenance activities. The log shall be available to City inspection staff upon request.
- 2. Failure to properly operate or maintain the water quality or quantity control facility according to the operation and maintenance plan may result in a civil penalty as specified in 17.38.045, Enforcement.
 - 3. A copy of the operation and maintenance plan shall be filed with the Bureau of Environmental Services. Staff may require a site map to be recorded and filed with the appropriate county Department of Assessment and Taxation.

A.2 POLICY FRAMEWORK

The Stormwater Policy Advisory Committee (SPAC) was established in April 1996 at the direction of the City Commissioner of Public Works. SPAC members included representatives of City bureaus, the Homebuilders Association, Metro, the Oregon Department of Environmental Quality, watershed advocates, and the development community. The SPAC was charged with recommending stormwater management policies to the Bureau of Environmental Services (BES). In addressing stormwater issues, the SPAC also considered other City goals and policies for environmental protection, density, transportation, and economic development.

In July 1997, the SPAC submitted and City Council accepted policy recommendations for new development (*Final Recommendations: Stormwater Management Requirements for New Development*). Council directed BES to develop this *Stormwater Management Manual* to implement policy recommendations for development. The *Stormwater Management Manual* was adopted on July 1, 1999. The *Stormwater Management Manual* is part of BES's Administrative Rules, authorized by Portland City Code Chapter 17.38, adopted by the Director of BES following a public review process, and filed with the City Auditor as required by Portland City Code Chapter 1.07.

In spring 1999, the City Council established the Stormwater Advisory Committee (SAC), whose members represent environmental, development, engineering, business, and community interests. One of the SAC's tasks was to review and make recommendations regarding changes to the manual. The SAC presented its recommendations to Council in April 2000 and again in August 2002. In addition, a public review process was conducted to obtain public comment on the manual. The SAC recommendations, public comments where appropriate, and BES staff changes are incorporated into this revised manual.

The policies that form the basis for this manual are codified in City Code Chapter 17.38, which is restated above.

A.3 APPEALS PROCESS

BES's appeals process allows development applicants to appeal staff interpretation of the City Code and adopted policies and procedures that guide the review of development proposals. City Council has adopted the appeals process. Applicants may appeal any issue related to interpretation of the stormwater management policy. For example, an applicant may appeal staff assessment of a site's stormwater management level or a permit denial. Applicants may not appeal the content or requirements of the policy, or technical parameters such as design storms, coefficients, and other technical criteria through this appeals process.

This process is not intended to address requested changes to technical specifications as adopted in the *Portland Standard Construction Specifications* or the *Bureau of Environmental Services Sewer Design Manual*. In these cases, applicants should contact BES's Development Assistance (503-823-7761) to request consideration by the BES Standards and Practices Committee. The committee has a separate process to consider changes to technical standards, such as the use of new stormwater management technologies.

Note: "Special circumstances," as described in [Section 1.11](#), are part of the standard application process and are not considered an appeal, unless the applicant is appealing denial of a special circumstance designation.

A.3.1 Tier One Appeal

Tier one is an appeal to BES's Administrative Appeals Committee, comprising the Chief Engineer, Development Services Manager, and Pollution Prevention Services Manager (or their designees). Applicants must notify BES of their appeal in writing, specifying the reason for the request and supporting their position with technical and factual data.

The Development Services Manager reviews all appeals applications for completeness. Once an application is complete, the process operates on a turnaround of 10 working days. The Development Services Manager schedules a meeting of the Administrative Appeals Committee and notifies the applicant of the meeting date, place, and time. The applicant may, but is not required to, attend the meeting. At the meeting, the Development Services Manager (or designee) presents a brief, cohesive overview of the questions and issues raised in the appeal. The applicant may briefly speak in support of the request. The committee reaches decisions by a majority opinion of the members. All decisions are recorded and mailed to the applicant.

A.3.2 Tier Two Appeal

Applicants not satisfied with the actions of the Administrative Appeals Committee may submit a written request for a hearing by BES's External Appeals Board. This five-member board is appointed by the Commissioner of Public Works to serve two-year terms. It also serves as the appeal board for the City's *Erosion Control Manual*, and may be convened for other appeals to BES staff decisions, as determined by BES's Director. The Development Services Manager performs administrative duties.

The Development Services Manager schedules a board meeting to occur within 14 days of receipt of the written request and notifies the applicant of the meeting date, place, and time. Public notice of the appeal request is given. A board meeting may not take place unless at least three members are present. The Development Services Manager presents a cohesive overview of the questions and issues raised in the appeal. The applicant, if present, may briefly address the board. Decisions are reached by a majority opinion of the board. All decisions are recorded and mailed to the applicant. Decisions of the board are binding.

A.4 UPDATE AND AMENDMENT PROCESS

This *Stormwater Management Manual* will be reviewed a minimum of every 3 years and updated as necessary. The review process will include:

- Consideration of changed and new technologies
- Review of appeals made during the preceding interval
- Review of requests for variances to standard design criteria for public and private facilities
- Review of all performance-based approaches approved since the last manual revision
- Review of recommendations from the Stormwater Advisory Committee
- Review of community comments and concerns
- Adjustment of internal review processes and submittal requirements
- Incorporation of new sections and issues

The amendment process will also include a mailing to interested persons to solicit suggestions for amendments or procedural changes; a public meeting to review amendments and solicit input; and documentation and explanation of any changes made.

Suggestions for changes and improvements can be made at any time and should be sent to:

Attn: Steve Fancher
City of Portland, BES
1120 SW 5th Ave., Room 1100
Portland, OR 97204

Any changes to the current stormwater management policies will require the approval of City Council. If changes to the manual are proposed, the Chief Engineer will distribute any proposed manual improvements to interested parties and internal staff no later than May 1 of the year the manual is to be revised. The amended manual will be approved by the Chief Engineer and Bureau Director no later than September 1 of the year the amendments will occur.